APPARATUS AND METHOD FOR WAVELENGTH-LOCKED LOOPS FOR SYSTEMS AND APPLICATIONS EMPLOYING ELECTROMAGNETIC SIGNALS

ABSTRACT OF THE DISCLOSURE

A wavelength-locked loop servo-control circuit and methodology that enables real time mutual alignment of an electromagnetic signal having a peaked spectrum function including a center wavelength and a wavelength selective device implementing a peaked passband function including a center wavelength, in a system employing electromagnetic waves. The circuit comprises a mechanism for applying a dither modulation signal at a dither modulation frequency to the electromagnetic signal, and inputting the dither modulated electromagnetic signal to the wavelength selective device; a mechanism for converting a portion of the dither modulated electromagnetic signal to an electric feedback signal; a mechanism for continuously comparing the feedback signal with said dither modulation signal and generating an error signal representing a difference between a frequency characteristic of the feedback signal and a dither modulation frequency; and a mechanism for adjusting the peaked spectrum function of the electromagnetic signal according to the error signal. The center wavelength of the electromagnetic signal and the wavelength selective device center wavelength become aligned when the frequency characteristic of the feedback signal is two times the dither modulation frequency.

09605505.050502